

APPLICANT'S REMARKS

Applicant has added new claims 48-50, amended claims 1 and 3-7, and amended withdrawn claims 9-10, 12-17, 28-29, and 31-35 to more particularly point out and distinctly claim the invention under 35 U.S.C. § 112. New claim 48 is directed to an assembly in a known poured-in-place wall mold cavity defined by opposed molding surfaces on vertically disposed, opposed wall molding panels having an upwardly directed top opening into which hardenable material is to be poured and hardened to produce a wall structure with horizontally disposed reinforcement rods. The assembly comprises a plurality of grid means suspended within the mold cavity for contiguously supporting the horizontally extending reinforcement rods so as to be freely contiguously disposed on the grid means at a plurality of horizontal locations vertically spaced along and between the opposed wall surfaces.

So the grid means is suspended from a wall panel and reinforcement rods are inserted onto the grid means by sliding them from one end of the wall molding panel toward the other end thereof on which the plurality of grid means is suspended. The grid means is effective to retain the freely contiguously disposed reinforcement rods at the plurality of horizontal locations vertically spaced along and between the opposed wall surfaces. Means are provided for removably attaching the grid means to the opposed wall molding panels at laterally spaced horizontal distances with respect to each other to retain the reinforcement rods in place while hardenable material is being poured into the wall mold cavity and allowed to harden.

New claim 49 more specifically defines each grid means to include a plurality of elongate elements for extending vertically in a direction substantially parallel to the molding surfaces and a

plurality of horizontal tie members fixedly connected to and substantially perpendicular to the elongate elements. The horizontal tie members are vertically spaced with respect to each other to provide contiguous support for the reinforcement rods at the vertically spaced horizontal locations. The reinforcement rods freely contiguously rest on the horizontal tie members at laterally spaced distances inwardly from each opposed molding surface.

New claim 50 characterizes each grid means of claim 48 as having a plurality of elongate elements for extending vertically along and substantially parallel to the vertically disposed molding surfaces. Each grid means has a plurality of tie members fixedly connected to the vertically disposed elongate elements for extending substantially perpendicular to the molding surfaces to define the vertically spaced horizontal locations. The tie members are thus effective to contiguously, freely support the horizontally disposed reinforcement rods at a preselected horizontal location spaced inwardly from each molding surface within the mold cavity.

Amended claim 1 is directed to an assembly for producing a vertically disposed poured-in-place wall structure having horizontally disposed reinforcement rods like those in the prior art. The assembly comprises the use of known equipment that defines a wall mold cavity with vertically disposed molding surfaces of laterally spaced wall forming panels for forming the wall structure. At the point of novelty, a plurality of grid means is suspended along the vertically disposed molding surfaces in the mold cavity for contiguously supporting the horizontally extending reinforcement rods which are freely contiguously disposed at a plurality of vertically spaced locations within the mold cavity. Means are provided for attaching the grid means to the opposed wall forming panels to retain the reinforcement rods in place at the plurality of vertically spaced locations while the

hardenable material is being poured into the mold cavity and allowed to harden.

Like amended claim 1, amended claim 6 is directed to an assembly for producing a vertically disposed poured-in-place wall structure having horizontally disposed reinforcement rods like those in the prior art. The assembly comprises the use of known equipment that defines a wall mold cavity with vertically disposed molding surfaces of laterally spaced wall forming panels for forming the wall structure. At the point of novelty, a plurality of grid means is suspended along the vertically disposed molding surfaces in the mold cavity for freely positioning and retaining freely contiguously disposed, horizontally extending reinforcement rods at a preselected horizontal location spaced inwardly from each opposed molding surface within the mold cavity. Means is provided for attaching each grid means to the opposed wall forming panels for locating the horizontally disposed reinforcement rods at spaced preselected vertical locations between the spaced molding surfaces.

The grid means is effective to retain the reinforcement rods in place at the preselected horizontal and vertical locations while the hardenable material is being poured into and allowed to harden within the mold cavity. The grid means includes a plurality of elongate grid elements that extend vertically along the vertically disposed molding surfaces and between the opposed molding surfaces. Each elongate grid element is fixedly attached to a plurality of tie members that are substantially perpendicular to the molding surfaces and horizontally disposed at spaced preselected vertical locations for contiguously supporting freely contiguously disposed, horizontal reinforcement rods. The grid elements include rod locating means for maintaining the reinforcement rods at horizontal locations spaced inwardly from each opposed molding surface while hardenable material is being poured into the mold cavity.

Amended claim 7 more specifically states that the rod locating means includes a pair of elongated substantially parallel, vertically disposed elongate elements fixedly extending across the plurality of vertically spaced tie members at each horizontal location between the molding surfaces to freely retain a reinforcement rod that extends horizontally across and normal to the plurality of vertically disposed elongate grid elements.

The Argument

Applicant's Invention

Applicant's invention provides a reinforcement rod suspending structure comprising a plurality of grid means attached to a first molding surface of a wall mold cavity for freely positioning reinforcement rods horizontally at a plurality of vertically spaced locations to facilitate completion of the mold cavity into which hardenable material is poured and allowed to harden. Use of Applicant's novel grid device in place of the prior art tie bars enables formation of a completed poured-in-place building fit for occupancy within three to four days from entry onto a building site, then forming a floor slab, and an upper building wall and ceiling structure according to the process of the invention.

Amended claims 1 and 3-7 directed to an assembly has grid means as set forth in amended withdrawn claim 9 directed to a grid device that replaces the known use of the Wepf tie bar 10 and Krecke tie bar 11 for horizontally disposing reinforcement rods in a known poured-in-place wall mold cavity. The known mold cavity having an upwardly directed top opening is defined by opposed molding surfaces of opposed vertically disposed wall molding panels. Applicant's unique assembly of a plurality of inexpensively produced grid means instead of the complex prior art tie bars is used for producing a wall structure with horizontally disposed reinforcement rods from

hardenable material poured into the wall mold cavity and hardened. Applicant's grid device design thus provides a novel assembly that significantly cuts the time for the construction of a known pour-in-place mold cavity into which hardenable material is to be poured and hardened to produce a wall structure with horizontally disposed reinforcement rods.

Applicant's novel grid device includes a plurality of elongate elements and a plurality of tie members fixedly connected and substantially perpendicular to and laterally spaced with respect to each other along the elongate elements for freely positioning the reinforcement rods within the mold cavity at a preselected horizontal location between each opposed molding surface and at preselected vertical locations spaced along the molding surfaces on the molding panels.

Unlike the conventional use of the complex tie bars 10 and 11 of the prior art of Wepf and Krecke, Applicant's a plurality of grid means suspended within the mold cavity provides a plurality of horizontal locations vertically spaced along and between opposed wall surfaces of the assembly. The grid means suspends from a top end thereof and freely contiguously supports the horizontally extending reinforcement rods on the grid means. Once the plurality of grid means is in place, reinforcing rods are inserted from one end of the molding panel construction so as to be freely contiguously disposed at a plurality of horizontal locations vertically spaced along and between opposed wall surfaces of the assembly. This obviates the necessity for placing individual tie bars 10 and 11 in a preselected array of openings formed in the wall molding panels at each vertical level for a plurality of horizontal locations and then attaching each tie bar individually in place.

The amount of time and money saved by using Applicant's novel grid device and its plurality of grid means provides new and unexpected results in that a building may be completed in three to

four days. Such is not possible using the individual tie bar approach of the prior art.

Reinstate Amended Withdrawn Claims 9, 10, 12, 14, 15, 16, and 17

Withdrawn claims 11 and 13 are cancelled; grid device claims 9, 10, 12, 14, 15, and 16 are amended; and claim 17 is amended and now depends from new claim 48. Claims 9, 10, 12, 14, 15, and 16 are directed to a grid device used in the elected assembly of amended claims 1 and 3-7. The assembly of amend claims 1 and 3-7 are no longer capable of being restricted from the grid device of amended claims 9, 10, 12, 14, 15, and 16 that is necessarily used in the complete assembly of amended claims 1 and 3-7 that produces the mold cavity into which hardenable material is being poured. Amended claim 17 now depends from new claim 48 directed to the elected assembly.

For these reasons, reinstatement of amended withdrawn claims 9, 10, 12, 14, 15, 16, and 17 is respectfully requested for no new search is required.

Reinstate Amended Withdrawn Claims 28, 29, and 31-35

Withdrawn claim 30 is cancelled, and the non-elected method of amended claims 28, 29, and 31-35 now requires an assembly of amended elected claims 1 and 3-7 and a grid device of amended withdrawn claims 9, 10, 12, 14, 15, and 16. Thus, the non-elected method claims are no longer capable of being restricted from the grid device and assembly that uses the grid device and assembly to effect the method of amended claims 28, 29, and 31-35.

For these reasons, reinstatement of amended withdrawn claims 28, 29, and 31-35 is respectfully requested for no new search is required.

Rejection Under 35 U.S.C. § 102

Claims 6 and 7 are rejected as being anticipated by the Wepf '156 patent which the examiner says includes "a plurality of grid elements (vertical components of 16, 18) that extend vertically

along the vertically disposed molding surfaces and between the opposed molding surfaces and each grid element [includes] a plurality of the members (10) that are substantially perpendicular to the molding surfaces horizontally disposed at spaced preselected vertical locations. The grid elements include rod locating means (vertical components 16, 18) (Col. 5, Line 40-50).”

Amended claim 6 defines a plurality of grid means suspended along the vertically disposed molding surfaces in the mold cavity “for freely positioning and retaining freely, contiguously disposed and horizontally extending reinforcement rods at a preselected horizontal location spaced inwardly from each opposed molding surface within the mold cavity,” and locates “the horizontally disposed reinforcement rods at spaced preselected vertical locations between the spaced molding surfaces.” Moreover, Applicant’s grid means are “effective to retain the reinforcement rods in place at the preselected horizontal and vertical locations while the hardenable material is being poured into and allowed to harden within the mold cavity.”

Amended claim 7 defines a “rod locating means” as shown in the specific embodiment of Figures 3 and 4.

Applicant’s invention eliminates the tie bars of the prior art poured-in-place mold cavity.

Wepf uses a unique tie bar structure and discloses none of the foregoing limitations of claims 6 and 7 but characterizes the problem being addressed by his tie bar invention.

In many concrete wall constructions it is desired to reinforce the wall with steel reinforcing rod. By and large the reinforcing rod, where desired, comprises a grid having vertical and horizontal members. The grid for such a wall is typically constructed by wiring the various members together where they cross such that the entire grid is

substantially supported. The location of the reinforcing rod is carefully controlled. As a heavy material such as concrete is poured into the space between the forms there is a tendency to move the reinforcing rods unless the rods are firmly located with respect to the forms (emphasis added).

This quote appears to be the source of the examiner's confusion regarding Applicant's "grid means" which is a reference to structure that maintains freely, contiguously disposed horizontal reinforcement rods in a mold cavity so that when the concrete is poured into the cavity, the rods are firmly located with respect to the forms. Applicant's "grid means" eliminates the need for Wepf's multiple tie members 10 used to hold the "grid having vertical and horizontal [steel reinforcing rod] members]" in place.

Wepf explains how his "grid" and its elements are attached to his novel tie bar.

The use of the tie bar can best be understood with reference to FIG. 1. Form 14 is first located at the desired position. The tie 10 is assembled to the form 14 by passing the head 32 through a hole in the form and securing with the wedge 36. Vertical reinforcing rods of grid 18 are then positioned according to the following method. A reinforcing rod is positioned against member 24 within the central portion 50 as shown in FIG. 1. A large diameter rod 80 may be brought into contact with the larger radius as shown in phantom outline in FIG. 2 and the reinforcing rod tied to the member 22 with the typical form of tying wire.

Applicant's plurality of grid means is effective to retain freely, contiguously disposed reinforcement rods at a plurality of horizontal locations vertically spaced along and between the opposed wall

surfaces. Wepf's plurality of tie bars 10 do not "retain freely contiguously disposed reinforcement rods" and is not part of grid means for supporting horizontally disposed reinforcement rods "at a plurality of horizontal locations vertically spaced along and between the opposed wall surfaces" as are Applicant's grid means.

Wepf ties vertical reinforcing rods to member 22 of tie bar 10 "with the typical form of tying wire." Applicant's grid means teaches away from vertical reinforcing rods to which Wepf ties horizontally disposed reinforcement rods. More specifically, Wepf states:

Once all the vertical rods of grid 18 have been located by tying the same to the moulded member 24 of several ties as may be appropriate, the horizontal rod of the grid may be positioned and tied in place by tying the horizontal rods to the vertical rods as required....

After all the rods of grid 18 have been tied in place, the horizontal rods of grid 16 are placed loosely on the tie bars. When all horizontal rods have been loosely positioned, the vertical rods of grid 16 may be tied to moulded member 22 of the tie bars as appropriate. This is done in the same manner as explained with respect to grid 18. After the vertical rods have been tied to the tie bars, the horizontal rods may be lifted up from their resting place and tied to the vertical rods. When all tying has been completed form 12 is passed over the heads 30 and positioned against the spacer 26. Form 12 is then secured by means of wedge 34 to create a rigid structure in which the forms and reinforcing rods are all accurately and rigidly located ready for pouring of concrete.

So Wepf ties all of the vertical reinforcing rods to tie bars 10 to stabilize the assembly to be placed in

the wall structure being formed. Wepf loosely positions all horizontal reinforcement rods contiguously on the various tie bars but does not leave them there. In fact, the Wepf “horizontal rods may be lifted up from their resting place and tied to the vertical rods.”

Wepf thus actually teaches away from Applicant’s invention wherein Applicant’s claimed grid means is “effective to retain the freely contiguously disposed reinforcement rods at a plurality of horizontal locations vertically spaced along and between the opposed wall surfaces.” Applicant’s grid means thereby cuts down the amount of time required to produce hardened concrete wall structures by using less expensive material in the construction of its grid means whose structure does not include either horizontal or vertical reinforcement rods as does Wepf. And additional time is not used to tie any reinforcement rods to Applicant’s grid means.

Applicant’s new claims 48-50 are directed to a novel assembly used in a known poured-in-place mold cavity and define tie members that are fixedly connected to vertically disposed elongate elements and extend substantially perpendicular to the molding surfaces for supporting the horizontal reinforcement rods in a freely, contiguously disposed position on the tie members. Wepf does not disclose a plurality of grid means laterally spaced along the vertical mold surface and that extend vertically with each grid means having rod locating means for positioning and retaining freely, horizontally disposed reinforcement rods at a plurality of preselected vertical and horizontal locations as now set forth in Applicant’s amended independent claims.

Wepf’s horizontally disposed reinforcement rods are connected to vertical reinforcement rods to form his well known reinforcing rod grids 16 and 18 that are both substantially parallel to the molding surfaces. In distinction, Applicant’s horizontal tie members are connected to vertical

elongate elements and are substantially perpendicular to the molding surfaces for contiguously supporting the freely disposed, horizontal reinforcement rods within the mold cavity.

For the foregoing reasons, Wepf is incapable of anticipating claims 6, 7, and 48-50 under 35 U.S.C. § 102

Rejection Under 35 U.S.C. § 103

Claims 1, and 3-5 are rejected as being unpatentable over Wepf in view of Krecke (U.S. Patent 4,655,014). The examiner says that “Wepf does not show freely horizontally disposed reinforcement rods being contiguously disposed on said tie members at a plurality of preselected vertical locations and at a preselected horizontal location spaced inwardly from each said opposed molding surface within said mold cavity.” However, “Krecke shows freely horizontally disposed reinforcement rods (72) being contiguously disposed on said tie members (11) at a plurality of preselected vertical locations (Fig. 16) and at a preselected horizontal location spaced inwardly from each said opposed molding surface within said mold cavity (Fig. 15, 16). It would have been obvious to one of ordinary skill in the art at the time the present invention was made to use tie members as in Krecke in the structure of Wepf to hold the horizontal reinforcement rods contiguously in place vertically.”

(Before specifically addressing this rejection under 35 U.S.C. § 103, Applicant notes the examiner admission that Wepf does not show “freely horizontally disposed reinforcement rods being contiguously disposed on said tie members at a plurality of preselected vertical locations and at a preselected horizontal location spaced inwardly from each said opposed molding surface within said mold cavity.” In other words, the examiner admits that Wepf does not anticipate the limitations of

claims 6, 7, and 48-50 thus requiring withdrawal of his rejection under 35 U.S.C. § 102.)

Regarding claim 3, the examiner says that “Wepf shows wherein each said grid element (16, 18) has a sufficient amount of rigidity to project outwardly from a vertically disposed molding surface and to horizontally suspend the reinforcement rods when said grid element is attached to said vertically disposed molding surface (Fig. 1).”

Applicant notes that Wepf’s reinforcing rod “grid element (16, 18)” is not “attached to said vertically disposed molding surface” as alleged but suspends from tie bars 10 to which the “grid element (16, 18)” is attached so that “grid element (16, 18)” is disposed in a direction parallel to the “vertically disposed molding surface” and does not “project outwardly from a vertically disposed molding surface” as alleged.

Regarding claim 4, the examiner says that “Wepf shows wherein said wall forming panels (12, 14) are portable for removable vertical disposition to form said wall mold cavity, and said means (10) for vertically disposing said wall forming panels is effective to maintain said wall forming panels independently with respect to each other in said vertical disposition (Fig. 1).”

While Wepf’s tie bars 10 perform a similar function as Applicant’s grid means, they do not perform its combination with the other unique functions set forth in amended claim 1 from which claim 4 depends. Thus Wepf does not teach the combination of Applicant’s novel grid means for freely, contiguously supporting horizontally disposed reinforcement rods at preselected horizontal locations at vertically spaced locations within the mold cavity.

Regarding claim 5, the examiner says that “Wepf shows wherein said plurality of vertically disposed grid elements (vertical component of 16, 18) are (sic) space (sic) horizontally with respect

to each said opposed spaced molding surfaces (12, 14).”

Applicant’s amended claim 5 states that “said plurality of grid means is laterally spaced horizontally with respect to each other along said opposed ~~spaced~~ molding surfaces.” The vertically disposed reinforcing rod “grid elements (vertical component of 16, 18) are (sic) space (sic) horizontally with respect to each said opposed spaced molding surfaces (12, 14).” However, the reinforcing rod “grid elements (vertical component of 16, 18)” are not “laterally spaced horizontally with respect to each other along said opposed ~~spaced~~ molding surfaces” as in Applicant’s claim. Amended claim 5 states that its grid means is a replacement for Wepf’s tie bars 10 and does not refer to any reinforcing rod grid element as the examiner suggests.

Amended claim 1 defines a “plurality of grid means” suspended “along the vertically disposed molding surfaces in the mold cavity for contiguously supporting the horizontally extending reinforcement rods which are freely contiguously disposed at a plurality of vertically spaced locations within the mold cavity.” As already explained, Wepf does not disclose “a plurality of grid means” for contiguously supporting horizontally extending reinforcement rods at a plurality of vertically spaced locations within the mold cavity. And Applicant requires no connection of the horizontal reinforcement rods to his grid structure like Wepf who requires tied connection to his tie bars 10 via the vertical reinforcing rods of his reinforcing rod “grid elements.”

Moreover, Krecke does not disclose “a plurality of grid means” for contiguously supporting horizontally extending reinforcement rods at a plurality of vertically spaced locations within the mold cavity. Krecke discloses only a plurality of tie bars 11 like Wepf’s tie bars 10 and no grid means that perform the recited functions in claims 1 and 3-5, and claims 48-50. So even if the

combination of references were appropriate, it still would not render claims 1, 3-5, and 48-50 obvious under 35 U.S.C. § 103.

With respect to Krecke's disclosure in his Figure 15, he states:

In regard to the tie members used in the constructions shown in FIGS. 16 to 18, the tie member 11, as shown in FIG. 15, may be provided with two peripheral grooves 71 extending around the shaft or central portion thereof, at the transition between the shaft or central portion and the plate-like end portions 62. Horizontal and/or vertical reinforcing bars 72 can thus be fitted into the grooves 71, to provide extra location for the bars and to further stiffen the structure (emphasis added).

Here Krecke teaches the skilled artisan that when horizontal reinforcement rods are used, they are not freely disposed on the tie bars 11 as Applicant claims regarding the relationship between his grid means and the horizontally, contiguously disposed reinforcement rods. But Krecke's rods 72 are fitted into grooves 71 to provide "extra location" for the reinforcement bars and to "further stiffen the structure." This necessarily implies that bars 72 substantially snugly fit into grooves 71 to stiffen the structure.

No Suggestion to Combine References

Any combining or modifying of the teachings of the prior art to produce the claimed invention can only establish obviousness where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *See In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Both the Wepf and Krecke references disclose use of a multiplicity of tie bars 10 and 11 respectively to hold horizontal and vertical rods as a reinforcing rod grid element (Wepf) or as individual rods (Krecke). Krecke teaches the contiguous disposition of the individual rods on the specially designed tie bars. Wepf teaches the attachment of a reinforcing rod grid element to a plurality of tie bars and specifically teaches away from as contiguous disposition of the horizontal reinforcement rods. Consequently, no teaching, suggestion, or motivation exists for combining the references.

Moreover, neither Wepf or Krecke teach, suggest, or would motivate a person having ordinary skill in the art to produce a plurality of grid means that maintains reinforcement rods in a plurality of horizontal and vertical locations within a wall mold cavity when pouring hardenable material into the mold cavity. So even if the combination of Wepf and Krecke were appropriate under the patent law, their combined teaching would not suggest or motivate a person having ordinary skill in the art to do what Applicant is claiming. Therefore, a person having ordinary skill in the art would not be lead to perform Applicant's claimed invention by following the combined teachings.

Finally, any grid means as claimed by Applicant would have to appear out of the air since neither reference discloses or teaches Applicant's novel grid device or plurality of grid means for performing the specifically claimed functions. Therefore, Wepf and Krecke, either individually or in combination, do not teach the skilled artisan Applicant's invention.

Summary and Conclusion

In view of the foregoing, the Wepf and Krecke references each teach away from Applicant's invention in that they each use a plurality of individually placed tie bars in the known poured-in-

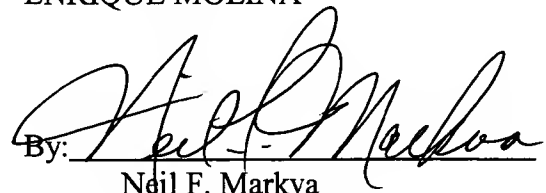
place mold cavity to hold horizontally disposed reinforcement bars in place when pouring hardenable material into the mold cavity. In contrast, Applicant's invention is directed to a unique grid device and the suspension of a plurality of grid means laterally spaced along a molding surface to retain reinforcing rods in a plurality of horizontal and vertical locations within a wall mold cavity when pouring hardenable material into the mold cavity. Consequently, withdrawal of the rejections under 35 U.S.C. §§ 102 and 103 is respectfully requested.

Applicant's currently amended withdrawn claims 9, 10, 12, 14, 15, 16, 17, 28, 29, and 31-35 no longer justify restriction to separate and independent inventions for no new search is required to find the point of novelty in the claims. For this reason, reinstatement of the amended withdrawn claims is respectfully requested.

For the foregoing reasons, claims 1 and 3-7, 9, 10, 12, 14, 15, 16, 17, 28, 29, and 31-35 are deemed allowable.

Respectfully submitted,

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